

SN: 10/808,992
Art Unit 1712

Patent No. H50058

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Schoenfeld

Confirmation No.: 7745

Application No.: 10/808,992

Group Art Unit: 1712

Filing Date: March 24, 2004

Examiner: Robert E. Sellers

For: Polycarboxy-Functionalized Prepolymers

DECLARATION OF RAINER SCHOENFELD UNDER 37 CFR § 1.132

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Rainer Schoenfeld, hereby declare the following:

1. I am the inventor of the above-captioned patent application ("the subject application"). Among my credentials, I received my diploma thesis in Chemistry from the University of Duesseldorf and I did postgraduate work on Molecularly Imprinted Polymers (MIPs) at the Polymer Institute of the University of Duesseldorf. I have conducted research in a number of technical areas, including toughening of thermosets, matrix resins for composite materials, epoxy adhesives, polyurethane adhesives, reactive prepolymers for adhesives and primers, and water soluble linear polyurethanes. I am presently the head of the polymer research department at Henkel KGaA, assignee of the subject patent application, in Duesseldorf, Germany.

2. It is my understanding that the claims of the subject application that are currently under examination are directed to curable compositions containing certain polycarboxy-functionalized prepolymers, in particular a curable composition comprising at least one polycarboxy-functionalized prepolymer having the structure $R^1[-X-C(=O)-Cy(CO_2H)_q[-X-C(=O)-R^3-CO_2H]_p[X-H]_{m-(n+p)}$, or at least one reaction product of said polycarboxy-functionalized prepolymer with at least one epoxy resin, or a mixture thereof,

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wherein R¹ is the m-valent radical of an elastomeric polymer, X is -S- or -NR²-, Cy is an aromatic or aliphatic ring, R² is H or a C₁-C₆ alkyl group, R³ is a radical containing at least one carbon-carbon double bond, m is an integer from 2 to 6, n is an integer from 1 to 6, p is 0 or an integer from 1 to 5, m is greater than or equal to n + p, and q is an integer of at least 2 and wherein said polycarboxy-functionalized prepolymer does not contain imide groups.

3. I have reviewed the Office Action dated December 6, 2006. As I understand it, the Examiner has applied the following rejections:

- a). Claims 1, 6, 8-10, 13, 18-22, 24 and 30 have been rejected under 35 U.S.C. Section 102(b) as being anticipated by Speranza et al. (U.S. Pat. No. 5,093,382; "Speranza I").
- b). Claims 1, 6, 8-10, 13, 18-22, 24 and 30 have been rejected under 35 U.S.C. Section 103(a) as being unpatentably obvious over Speranza et al. (U.S. Pat. No. 5,128,441; "Speranza II").
- c). Claims 1, 8-10, 13, 18-22 and 24 have been rejected under 35 U.S.C. Section 103(a) as being unpatentably obvious over Japanese Patent No. 4-89840.
- d). Claims 1, 9, 10, 18, 19, 21, 22 and 24 have been rejected under 35 U.S.C. Section 103(a) as being unpatentably obvious over Takahashi et al (U.S. Pat. No. 5,885,723) and Rieder et al. (U.S. Pat. No. 4,172,802).

4. This declaration is being made for the purpose of providing a technical analysis of the disclosures of certain of the references relied on in these rejections, thereby demonstrating the non-obviousness of the subject matter claimed in the above-captioned application.

5. The Speranza I reference describes "...carboxyl group terminated addition reaction products of a polyoxyalkylene polyamine or polyoxyalkylene polyol reactant with a polycarboxylic acid reactant..." [Abstract]. This reference further discloses the conditions that should be used to form such reaction products at Column 14, lines 38-64. In particular, the reference teaches that reaction temperatures within the range of about 150 to about 250 degrees should be employed, with by-product water of reaction preferably being removed from the reaction mixture as it is formed. The Speranza I reference contains only one

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working example where trimellitic acid or a derivative thereof (e.g., trimellitic anhydride) is utilized as the "polycarboxylic acid reactant". The product thereby obtained is listed as "Product F" at Column 15, lines 43-44, which is said to have an acid value of 0.803 meq/g [Column 16, line 9]. Based on my knowledge and experience in the field, such reaction product contained imide groups due to internal condensation of the initially formed amide groups with adjacent carboxylic acid groups under the reaction conditions employed, since otherwise the acid value would have been approximately twice the value observed (i.e., the expected acid value, in the absence of imide group formation, is calculated to be 1.68 meq/g based on the structures and stoichiometry of the reactants employed).

6. The Speranza II reference describes "...reacting a polyoxyalkylene diamine or triamine having terminal primary amine groups with an amount of a dicarboxylic acid or an anhydride or a C₁ to C₄ alkyl ester thereof, sufficient to react one mole of the dicarboxylic acid reactant with each terminal primary amine group of the polyoxyalkylene diamine or triamine to thereby prepare an intermediate condensation product having terminal carboxyl groups" [Column 5, lines 7-14]. The Speranza II reference further discloses, at Column 5, lines 25-50, the conditions under which this condensation reaction should be carried out. Such reaction conditions, in particular relatively high reaction temperatures (e.g., 200 degrees C) and removal of water during the reaction, were employed in the working examples of the Speranza II reference. Based on my knowledge and experience in the field, such conditions will result in the formation of a reaction product containing imide groups where the "dicarboxylic acid or an anhydride or a C₁ to C₄ alkyl ester thereof" is trimellitic acid, trimellitic anhydride or a C₁ to C₄ alkyl ester of trimellitic acid.

7. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: 05/07/07


Rainer Schoenfeld